

CLAIM AMENDMENTS

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1-6. (canceled)

1 7. (previously presented): A method of manufacturing a semiconductor circuit on a substrate,
2 comprising the steps of:
3 providing first and second substrate handling robots;
4 coupling a first process chamber to the first robot so that the first robot can transfer a substrate
5 into and out of the first process chamber, wherein the first process chamber is a deposition chamber or
6 a plasma chamber, and wherein the first process chamber is not coupled to the second robot;
7 coupling a second process chamber to the second robot so that the second robot can transfer a
8 substrate into and out of the second process chamber, wherein the second process chamber is a
9 deposition chamber or a plasma chamber, and wherein the second process chamber is not coupled to
10 the first robot;
11 coupling one or more pass-through chambers to both the first robot and the second robot so
12 that both the first robot and the second robot can transfer a substrate into and out of each of the pass-
13 through chambers, wherein said one or more pass-through chambers include a first pass-through
14 chamber; and
15 subsequently performing the sequential steps of:
16 the first robot transferring a first substrate into the first pass-through chamber;
17 heating said first substrate within the first pass-through chamber; and
18 the second robot removing said first substrate from the first pass-through chamber.

1 8. (previously presented): A method according to claim 7, further comprising the subsequent step of:
2 the second robot transferring said first substrate to the second process chamber.

1 9. (previously presented): A method according to claim 8, further comprising the subsequent
2 sequential steps of:
3 the second robot removing said first substrate from the second process chamber;
4 the second robot transferring said first substrate into one of the pass-through chambers;
5 the first robot removing said first substrate from said one pass-through chamber; and
6 the first robot transferring said first substrate to the first process chamber.

1 10. (previously presented): A method according to claim 9, wherein said one pass-through chamber is
2 the first pass-through chamber.

1 11. (previously presented): A method according to claim 9, further comprising the steps of:
2 after the step of the second robot transferring said first substrate to the second process
3 chamber, depositing tantalum or tantalum nitride on the substrate within the second process chamber;
4 and
5 after the step of the first robot transferring said first substrate to the first process chamber,
6 depositing copper on the substrate within the first process chamber.

1 12. (previously presented): A method according to claim 9, further comprising the steps of:
2 after the step of the second robot transferring said first substrate to the second process
3 chamber, removing native oxide from the surface of the substrate within the second process chamber;
4 and
5 after the step of the first robot transferring said first substrate to the first process chamber,
6 depositing copper on the substrate within the first process chamber.

1 13. (previously presented): A method according to claim 12, further comprising the steps of:
2 coupling a third process chamber to the second robot so that the second robot can transfer a
3 substrate into and out of the third process chamber, wherein the third process chamber is not coupled
4 to the first robot;
5 after the step of removing native oxide and before the step of the second robot transferring the
6 first substrate into one of the pass-through chambers, performing the sequential steps of:
7 the second robot removing the first substrate from the second process chamber;
8 the second robot transferring the first substrate into the third process chamber; and
9 within the third process chamber, depositing tantalum or tantalum nitride on the first substrate.

1 14. (currently amended): A method according to claim 7, further comprising the steps of:
2 coupling a loadlock chamber to one of said first and second robots so that said one robot can
3 transfer a substrate into and out of the loadlock chamber, wherein the loadlock chamber is not coupled
4 to the other one of said first and second robots, and wherein the loadlock chamber is not coupled to
5 any of said one or more pass-through chambers; and

6 before the step of the first robot transferring said first substrate into the first pass-through
7 chamber, said one robot removing said first substrate from the loadlock chamber.

1 15. (currently amended): A method according to claim 7, further comprising the steps of:
2 coupling a loadlock chamber to one of said first and second robots so that said one robot can
3 transfer a substrate into and out of the loadlock chamber, wherein the loadlock chamber is not coupled
4 to the other one of said first and second robots, and wherein the loadlock chamber is not coupled to
5 any of said one or more pass-through chambers; and
6 after the step of the second robot removing said first substrate from the first pass-through
7 chamber, said one robot transferring said first substrate into the loadlock chamber.

1 16. (currently amended): A method according to claim 7, further comprising the steps of:
2 coupling a loadlock chamber to the first robot so that the first robot can transfer a substrate into
3 and out of the loadlock chamber, wherein the loadlock chamber is not coupled to the second robot, and
4 wherein the loadlock chamber is not coupled to any of said one or more pass-through chambers; and
5 before the step of the first robot transferring said first substrate into the first pass-through
6 chamber, the first robot removing said first substrate from the loadlock chamber.

1 17. (currently amended): A method according to claim 8, further comprising the steps of:
2 coupling a loadlock chamber to the first robot so that the first robot can transfer a substrate into
3 and out of the loadlock chamber, wherein the loadlock chamber is not coupled to the second robot, and
4 wherein the loadlock chamber is not coupled to any of said one or more pass-through chambers; and
5 after the step of the second robot transferring said first substrate to the second process
6 chamber, the subsequent steps of:
7 the second robot transferring said first substrate into one of the pass-through chambers;
8 the first robot removing said first substrate from said one pass-through chamber; and
9 the first robot transferring said first substrate into the loadlock chamber.

1 18. (previously presented): A method according to claim 7, further comprising the step of:
2 providing a resistive heater within the pass-through chamber;
3 wherein the heating step comprises the step of said resistive heater heating said first substrate
4 within the pass-through chamber.

1 19. (previously presented): A method according to claim 7, wherein the heating step comprises the step
2 of:

3 directing infrared radiation so as to heat said first substrate within the pass-through chamber.

1 20. (previously presented): A method of depositing a copper layer on a substrate, comprising the steps
2 of:

3 providing first and second substrate handling robots;

4 coupling a first process chamber to the first robot so that the first robot can transfer a substrate
5 into and out of the first process chamber, wherein the first process chamber is a deposition chamber or
6 a plasma chamber, and wherein the first process chamber is not coupled to the second robot;

7 coupling a second process chamber to the second robot so that the second robot can transfer a
8 substrate into and out of the second process chamber, wherein the second process chamber is a
9 deposition chamber or a plasma chamber, and wherein the second process chamber is not coupled to
10 the first robot;

11 coupling one or more pass-through chambers to both the first robot and the second robot so
12 that both the first robot and the second robot can transfer a substrate into and out of each of the pass-
13 through chambers, wherein said one or more pass-through chambers include a first pass-through
14 chamber; and

15 subsequently performing the sequential steps of:

16 the first robot transferring a first substrate into the first pass-through chamber;

17 heating said first substrate within the first pass-through chamber;

18 the second robot removing said first substrate from the first pass-through chamber;

19 the second robot transferring said first substrate to the second process chamber;

20 within the second process chamber, depositing tantalum or tantalum nitride on the substrate;

21 the second robot transferring said first substrate into one of the pass-through chambers;

22 the first robot removing said first substrate from said one pass-through chamber;

23 the first robot transferring said first substrate into the first process chamber; and

24 within the first process chamber, depositing copper on the substrate.

1 21. (previously presented): A method of depositing a copper layer on a substrate, comprising the steps
2 of:

3 providing first and second substrate handling robots;

4 coupling a first process chamber to the first robot so that the first robot can transfer a substrate
5 into and out of the first process chamber, wherein the first process chamber is a deposition chamber or
6 a plasma chamber, and wherein the first process chamber is not coupled to the second robot;

7 coupling a second process chamber to the second robot so that the second robot can transfer a
8 substrate into and out of the second process chamber, wherein the second process chamber is a
9 deposition chamber or a plasma chamber, and wherein the second process chamber is not coupled to
10 the first robot;

11 coupling one or more pass-through chambers to both the first robot and the second robot so
12 that both the first robot and the second robot can transfer a substrate into and out of each of the pass-
13 through chambers, wherein said one or more pass-through chambers include a first pass-through
14 chamber; and

15 subsequently performing the sequential steps of:

16 the first robot transferring a first substrate into the first pass-through chamber;

17 heating said first substrate within the first pass-through chamber;

18 the second robot removing said first substrate from the first pass-through chamber;

19 the second robot transferring said first substrate to the second process chamber;

20 within the second process chamber, removing native oxide from the surface of the substrate;

21 the second robot transferring said first substrate into one of the pass-through chambers;

22 the first robot removing said first substrate from said one pass-through chamber;

23 the first robot transferring said first substrate into the first process chamber; and

24 within the first process chamber, depositing copper on the substrate.

1 22. (previously presented): A method according to claim 21, further comprising the steps of:

2 coupling a third process chamber to the second robot so that the second robot can transfer a
3 substrate into and out of the third process chamber, wherein the third process chamber is not coupled
4 to the first robot; and

5 after the step of removing native oxide and before the step of the second robot transferring the
6 first substrate into one of the pass-through chambers, performing the sequential steps of:

7 the second robot removing the first substrate from the second process chamber;

8 the second robot transferring the first substrate into the third process chamber; and

9 within the third process chamber, depositing tantalum or tantalum nitride on the first substrate.